

PATENT ABSTRACTS OF JAPAN

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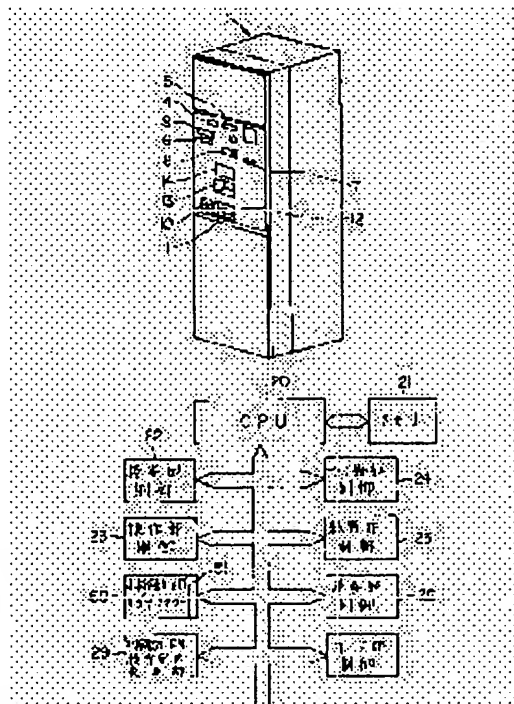
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(54) AUTOMATIC FARE ADJUSTING MACHINE TO BE APPLIED ALSO TO CONTACTLESS CARD

(57)Abstract:

PURPOSE: To provide an automatic fare adjusting machine to be used also for a contactless type passenger ticket or commutation ticket without issuing an adjusting ticket in addition to application to magnetic tickets only by slightly changing a conventional machine.

CONSTITUTION: The automatic fare adjusting machine for reading out data from an inserted magnetic card type passenger ticket or commutation ticket, operating and displaying a lacking amount, and when an amount matched with the lacking amount is injected, issuing an adjusting ticket, a contactless IC card receiving part 13 and a reader/writer 60 to be contactlessly communicated with a contactless IC card set up on the receiving part 13 are arranged on a customer panel part and a CPU executes a series of communication with the IC card through the reader/writer 60, reads out required data, computes a lacking amount based upon the read data, displays the lacking amount on a display part of the customer panel part, and when an amount matched with the lacking amount is injected, issues an adjusting ticket.



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CLAIMS

[Claim(s)]

[Claim 1] Necessary data are read in the magnetic-card type ticket inserted from insertion opening of the reception panel section, or a commuter pass with a reader. In the automatic-reset machine which will issue a settlement-of-accounts ticket if the amount of money which is equipped with CPU which displays the insufficient amount of money concerned on the display of the above-mentioned reception panel section, and balances the above-mentioned insufficient amount of money is invested while calculating the insufficient amount of money based on this data It has wireless-type the reader/writer which can communicate to the non-contact card put on it by this receiving part for noncontact IC cards while having the receiving part for non-contact cards in the above-mentioned reception panel section, and non-contact. Above CPU performs communication of the above-mentioned non-contact card and a single string through the above-mentioned reader/writer, and necessary data are read. The automatic-reset machine of the non-contact card combination characterized by issuing a settlement-of-accounts ticket if the amount of money which is made to display the insufficient amount of money concerned on the display of the above-mentioned reception panel section, and balances the above-mentioned insufficient amount of money is invested while calculating the insufficient amount of money based on this data.

[Claim 2] Necessary data are read in the magnetic-card type ticket inserted from insertion opening of the reception panel section, or a commuter pass with a reader. In the automatic-reset machine which will issue a settlement-of-accounts ticket if the amount of money which is equipped with CPU which displays the insufficient amount of money concerned on the display of the above-mentioned reception panel section, and balances the above-mentioned insufficient amount of money is invested while calculating the insufficient amount of money based on this data It has the non-contact card, and wireless-type the reader/writer which can be communicated put on this receiving part for noncontact IC cards while having the cradle section for non-contact cards in the above-mentioned reception panel section. Above CPU Perform communication of the above-mentioned non-contact card and a single string through the above-mentioned reader/writer, and necessary data are read. If the amount of money which is made to display the insufficient amount of money concerned on the display of the above-mentioned reception panel section, and balances the above-mentioned insufficient amount of money is invested while calculating the insufficient amount of money based on this data The automatic-reset machine of the non-contact card combination characterized by ***** which writes the data of the purport which carried out settlement-of-accounts termination in the above-mentioned non-contact card through the above-mentioned station, and makes the handling of the card concerned possible as a settlement-of-accounts ticket.

[Claim 3] The automatic-reset machine of the non-contact card combination according to claim 1 or 2 characterized by having the actuation annunciator section for non-contact cards in the reception panel section.

[Claim 4] A reader/writer is the automatic-reset machine of the non-contact card combination according to claim 1 or 2 characterized by having a RUBU antenna, CPU and the I/O circuit which performs transfer of a signal, and a strange demodulator circuit.

[Claim 5] The receiving part for noncontact IC cards of the reception panel section is the automatic-reset machine of the non-contact card combination according to claim 1 or 2 which is the pars basilaris ossis occipitalis of the hollow which carries out opening to a front face, and is characterized by the loop antenna of a reader/writer being arranged by the wall surrounding the hollow concerned.

[Claim 6] Writing is the automatic-reset machine of the non-contact card combination according to claim 2 characterized by being carried out to the I/O circuit of a reader/writer by connecting the control circuit of a card directly.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention is equipped with CPU which displays the insufficient amount of money concerned on the display of the above-mentioned reception panel section while it reads necessary data in the ticket inserted from insertion opening of the reception panel section, or a commuter pass with a reader and calculates the insufficient amount of money based on this data, and when the amount of money corresponding to the above-mentioned insufficient amount of money is invested, it relates to the automatic-reset machine which issues a settlement-of-accounts ticket.

[0002]

[Description of the Prior Art] In recent years, the **** business of a station is left to the automatic ticket vending machine which puts the ticket of a magnetic-card mold on the market, ticket gate business is also advanced for full automation by the spread not only of the **** business of a station but automatic gate machines, and an automatic-reset machine is used also for settlement of accounts of the tariff accompanying riding past or destination modification.

[0003] Drawing 4 shows the appearance of this automatic-reset machine. this drawing -- setting -- 1 -- a housing and 2 -- the body of a housing 1, and 3 -- the reception panel section of a housing 1, and 4 -- an insufficient amount-of-money display and 5 -- for a slot for bills and 8, as for a ticket, commuter pass insertion opening, and 10, the carbon button for cancellation and 9 are [an injection amount-of-money display and 6 / coin input port and 7 / a settlement-of-accounts ticket outlet and 11] change saucers. It is the memory in which drawing 5 shows the control system of this automatic-reset machine to, 20 stores arithmetic and program control (CPU) in, and 21 stores a program and TETA. 22 -- for a coin validation unit control section and 25, as for an issue-of-banknotes section control section and 27, a bill section control section and 26 are [a reception section control section and 23 / a control unit control section and 24 / a reader / writer control section, and 28] change section control sections.

[0004] (1) If a settlement-of-accounts person inserts a riding-past ticket (or commuter pass) in a ticket and the commuter pass insertion opening 9 now, the reader/writer which is controlled by the reader / writer control section 27 and which is not illustrated will read the necessary data currently written in the magnetic film applied to the rear face of the ticket (or commuter pass) concerned.

[0005] (2) CPU20 reads the data relevant to this necessary data from memory 21, collates them, calculates the insufficient amount of money, and make it display it on the insufficient amount-of-money display 4.

[0006] (3) A settlement-of-accounts person looks at the displayed insufficient amount of money, is equal to the insufficient amount of money concerned, or inserts or invests the amount of money exceeding the insufficient amount of money concerned for a bill or a coin, and a bill and a coin from a slot for bills 7 and coin input port 6.

[0007] (4) The bill control section 25 reads the amount of money of the inserted bill, and the **** control section 24 reads the amount of money of the thrown-in coin.

[0008] (5) CPU20 makes change take out to the change saucer 11 by the change section control section 28, when the existence of change and the amount of change are both calculated as if the thrown-in sum total of the amount of money is calculated and the injection amount of money is displayed on through and the injection amount-of-money display 5 for the reception section control section 22 and there is change.

[0009] (6) Drive the issue-of-banknotes section control section 26 to coincidence, and make it issue a settlement-of-accounts ticket.

[0010] (7) A settlement-of-accounts person can pass through the sale-of-tickets gate of an automatic gate machine by putting into the automatic gate machine of the magnetic formula which does not illustrate this settlement-of-accounts

ticket.

[0011] In recent years, memory is built in with a microcomputer etc., data processing capacity is given to the card itself, storage capacity is also increased by leaps and bounds as compared with a magnetic card, and the noncontact IC card which talks with an external device on radio is developed.

[0012] While the typical thing of this noncontact IC card absorbs the vibrational energy concerned with echo sounder receivers, such as an antenna, also at the place of the vibrational energy (for example, induction field by the electromagnetic wave) which an external device generates and transforms it into power, it takes out and carries out signal processing of data and the instruction which are included in vibrational energy, performs identification code, read-out processing of data, etc. based on modification of data, an addition, or a read-out instruction, and answers the above-mentioned external device.

[0013] Gating arrangements, such as a wicket of the station at the time of using this kind of noncontact IC card for a commuter pass etc., will talk by the commuter pass concerned etc. and wireless, as shown in drawing 6.

[0014] In drawing 6, 30 is the gate of a wicket and has contained the fixed station 40 shown in drawing 7. In drawing 6, 31 is a judgment display. 50 builds in the circuit as been the noncontact IC card which PAX M holds and shown in drawing 7.

[0015] In this configuration, from the transceiver antenna (loop antenna) 41, the fixed station 40 repeated the appeal signal (trigger signal) So the short fixed period (several 10ms), and is emitting it. If it is presented to the field (on an antenna less than 25cm) which can be communicated as a noncontact IC card 50 shows drawing 6 , as shown in the communication chart of drawing 8 The noncontact IC card 50 concerned receives the above-mentioned appeal signal (trigger signal) So. After decoding in a control circuit 53 after restoring to this in a demodulator circuit 52, and transmitting a reply signal Q, Fixed data, such as an arrival-and-departure station stored in memory 54, a course station, and the term of validity, are read in predetermined sequence, the data concerned are modulated in a modulation circuit 55, and through emission of the transceiver antenna (loop antenna) 51 is carried out. It gets over in a demodulator circuit 42, and the fixed station 40 which received the signal which carried this data collates with the data for collating with which delivery and a control circuit 43 store the data concerned in memory 44 in the control circuit 43, and judges authorization/disapproval of passage of the PAX. In permitting passage, it transmits that and a necessary instruction to a noncontact IC card 50 through a modulation circuit 45 and the transceiver antenna (loop antenna) 41. A fixed station 40 is answered [that performed a series of processings based on the above-mentioned instructions (adjustable / of a use day, a use time of day, a use station, etc., etc. /, or write-in command of updating data), and processing was completed, and] in the noncontact IC card 50 which received this signal. The fixed station which received this reply displays passage authorization on the judgment display 11.

[0016] In addition, the transceiver antenna (loop antenna) 41 has given the die length which is sufficient for securing the time amount which communication of the noncontact IC card 50 top Norikazu ream of one PAX who passes while he walks along the gate completes.

[0017]

[Problem(s) to be Solved by the Invention] Spread of such non-contact IC card system gating arrangements reduces worth of a noncontact IC card in being unable to use the above mentioned conventional settlement-of-accounts machine upwards, and issuing a settlement-of-accounts ticket also in a noncontact IC card.

[0018] It was made in order that this invention might solve this problem, and some modification is only added to the conventional thing, not only a magnetic formula but a ticket, a commuter pass, etc. of a non-contact card mold can be used, and, in the case of the ticket of a non-contact card mold, a commuter pass, etc., it aims at offering the automatic-reset machine which can make unnecessary the issue of banknotes of a settlement-of-accounts ticket.

[0019]

[Means for Solving the Problem] This invention in order to attain the above-mentioned purpose in claim 1 Necessary data are read in the magnetic-card type ticket inserted from insertion opening of the reception panel section, or a commuter pass with a reader. In the automatic-reset machine which will issue a settlement-of-accounts ticket if the amount of money which is equipped with CPU which displays the insufficient amount of money concerned on the display of the above-mentioned reception panel section, and balances the above-mentioned insufficient amount of money is invested while calculating the insufficient amount of money based on this data It has the reader/writer which can communicate to the non-contact card put on it by this receiving part for non-contact cards while having the receiving part for non-contact cards in the above-mentioned reception panel section, and non-contact. Above CPU Perform communication of the above-mentioned non-contact card and a single string through the above-mentioned reader/writer, and necessary data are read. While calculating the insufficient amount of money based on this data, the insufficient amount of money concerned was displayed on the display of the above-mentioned reception panel

section, and when the amount of money corresponding to the above-mentioned insufficient amount of money was invested, it considered as the configuration which issues a settlement-of-accounts ticket.

[0020] In claim 2, necessary data are read in the magnetic type ticket inserted from insertion opening of the reception panel section, or a commuter pass with a reader. In the automatic-reset machine which will issue a settlement-of-accounts ticket if the amount of money which is equipped with CPU which displays the insufficient amount of money concerned on the display of the above-mentioned reception panel section, and balances the above-mentioned insufficient amount of money is invested while calculating the insufficient amount of money based on this data It has the non-contact card, and the reader/writer which can be communicated put on this receiving part for non-contact cards while having the receiving part for non-contact cards in the above-mentioned reception panel section. Above CPU Perform communication of the above-mentioned non-contact card and a single string through the above-mentioned reader/writer, and necessary data are read. If the amount of money which is made to display the insufficient amount of money concerned on the display of the above-mentioned reception panel section, and balances the above-mentioned insufficient amount of money is invested while calculating the insufficient amount of money based on this data It considered as the individuality which writes the data of the purport which carried out settlement-of-accounts termination in the above-mentioned non-contact card through the above-mentioned reader/writer, and makes the handling of the card concerned possible as a settlement-of-accounts ticket.

[0021] In claim 3, it considered as the configuration which has the actuation annunciator section for non-contact cards in the reception panel section.

[0022] It was made for a station to have a RUBU antenna, CPU and the I/O circuit which performs transfer of a signal, and a strange demodulator circuit in claim 4.

[0023] In claim 5, the receiving part for non-contact cards of the reception panel section is a pars basilaris ossis occipitalis of the hollow which carries out opening to a front face, and was taken as the configuration in which the loop antenna of a reader/writer is arranged by the wall surrounding the hollow concerned.

[0024] In claim 6, the above-mentioned writing was made to be performed by connecting both cards with a reader/writer directly.

[0025]

[Function] In this invention, since not only a magnetic type but a ticket, a commuter pass, etc. of a non-contact card mold can be used and the issue of banknotes of a settlement-of-accounts ticket can be made unnecessary in the case of the ticket of a non-contact card mold, a commuter pass, etc., reduction of a running cost and reduction of failure can be aimed at.

[0026]

[Example] Hereafter, one example of this invention is explained with reference to a drawing.

[0027] In drawing 1, 12 is the hollow established in the reception panel section 3, and the pars basilaris ossis occipitalis of this hollow 3 is the receiving part 13 for non-contact cards. 14 is the non-contact card actuation annunciator section prepared in the reception panel section 3.

[0028] Drawing 2 is what showed the control system, 60 is the reader/writer for non-contact cards (fixed station), and 29 is an actuation guidance control section for non-contact cards.

[0029] This fixed station 60 is equipped with RUNTENA 64 and 65 for the I/O circuit (I/O circuit) 61, a modulation circuit 62, a demodulator circuit 63 and the object for transmission, and reception as shown in drawing 3, and the I/O circuit 61 is connected to CPU20.

[0030] (1) The non-contact card actuation annunciator section 14 shows the purport which can also use a noncontact IC card (commuter pass of a noncontact IC card mold) 50.

[0031] Moreover, from the fixed station 60, the transmitting antenna (loop antenna) 64 to the appeal signal (trigger signal) So was repeated the short fixed period (several 10ms), and is emitted.

[0032] (2) It should present the hollow 12, a settlement-of-accounts person put a card 50 on the rest 13 for non-contact cards of the automatic-reset machine of the example at a riding-past station, or now, had in a hand.

[0033] (3) After a noncontact IC card 50 receives the above-mentioned appeal signal (trigger signal) So, it decodes it in a control circuit 53 after it restores to this in a demodulator circuit 52, and it transmits a reply signal Q, it modulates necessary data read-out and the data concerned among the data stored in memory 54 in a modulation circuit 55, and carries out through emission of the transceiver antenna (loop antenna) 51. It restores to the fixed station 20 which received the signal which carried this data in a demodulator circuit 22.

[0034] The above-mentioned data to which it restored are transmitted to CPU20 through the I/O circuit 61.

[0035] (4) Collate CPU20 with the data for collating which store the data concerned in memory 21, it calculates the insufficient amount of money, and make it display it on the insufficient amount-of-money display 4.

[0036] (5) A settlement-of-accounts person looks at the displayed insufficient amount of money, is equal to the insufficient amount of money concerned, or inserts or invests the amount of money exceeding the insufficient amount of money concerned for a bill or a coin, and a bill and a coin from a slot for bills 7 and coin input port 6.

[0037] (6) A bill control section reads the amount of money of the inserted bill, and a **** control section reads the amount of money of the thrown-in coin.

[0038] (7) CPU20 makes change take out to the change saucer 11 by the change control section, when the existence of change and the amount of money of change are both calculated as if the thrown-in sum total of the amount of money is calculated and the injection amount of money is displayed on through and the injection amount-of-money display 5 for the reception section control section 22 and there is change.

[0039] (8) Drive an issue-of-banknotes section control section to coincidence, and make it issue a settlement-of-accounts ticket.

[0040] (9) A settlement-of-accounts person can pass through the sale-of-tickets gate of an automatic gate machine by putting this settlement-of-accounts ticket into an automatic gate machine.

[0041] In the above-mentioned example, although the settlement-of-accounts ticket is issued, the issue of banknotes of a settlement-of-accounts ticket can be made unnecessary by programming as follows. That is, when (10) insufficient amount of money is paid, CPU20 orders it "value attachment for the insufficient amount of money", and "value attachment for the insufficient amount of money" of a purport which is made to write a certain data in the memory of through and a card 50 and by which the insufficient amount of money was paid in the fixed station 60 is performed.

[0042] (11) The non-contact card actuation annunciator section 14 displays the purport which is "under writing" during this writing.

[0043] (12) After this writing finishes, the non-contact card actuation annunciator section 14 displays the purport, for example, "please take a card" etc., which processing ended.

[0044] (13) If a settlement-of-accounts person takes out the card 30 with which "value attachment for the insufficient amount of money" was made from a rest 13 according to this display and presents the field of the automatic gate machine of drawing 6 which can be communicated, he can pass through the gate (in this case, sale-of-tickets gate).

[0045] In addition, it is good also as a configuration by which direct continuation of the control circuit 53 of the card 50 put on the receiving part 13 is carried out to the I/O circuit 61 of a reader / writer 60 in each above-mentioned example although a reader / writer 60, and a card 50 are exchanged on radio.

[0046] Although the receiving part was here prepared in order to improve communicative dependability, it is also possible for it to be made to keep put in in a pocket etc.

[0047]

[Effect of the Invention] Since this invention only adds some modification to the conventional thing, can use not only a magnetic type but a ticket, a commuter pass, etc. of a non-contact card mold and can make unnecessary the issue of banknotes of a settlement-of-accounts ticket in the case of the ticket of a non-contact card mold, a commuter pass, etc. as it was explained above, ***** of a running cost and reduction of failure can be aimed at.

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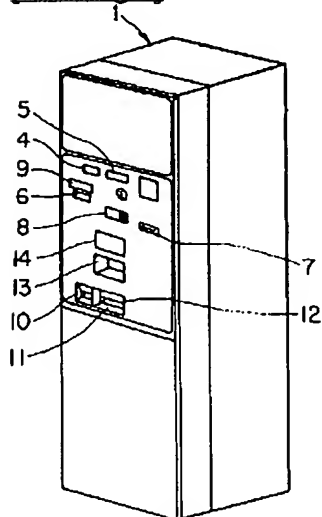
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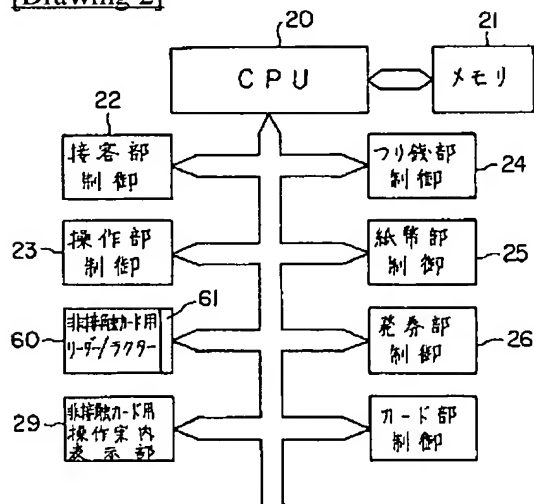
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DRAWINGS

[Drawing 1]



[Drawing 2]



[Drawing 4]

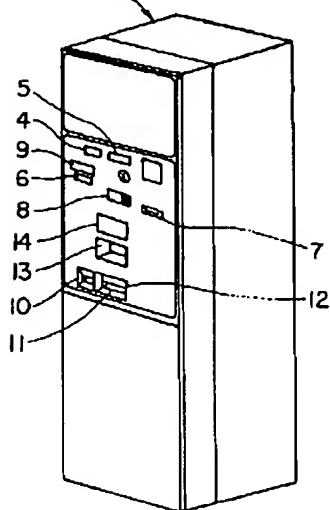
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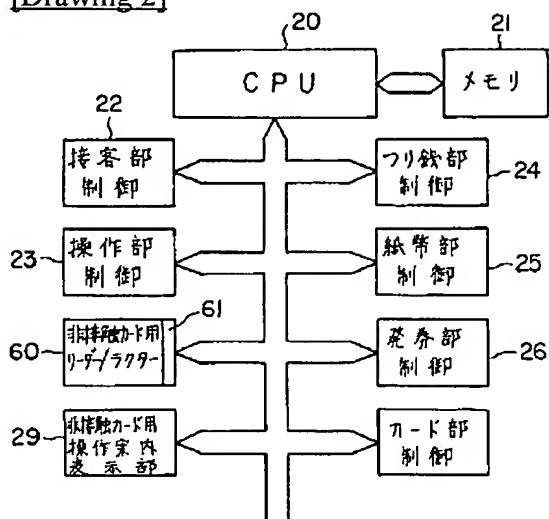
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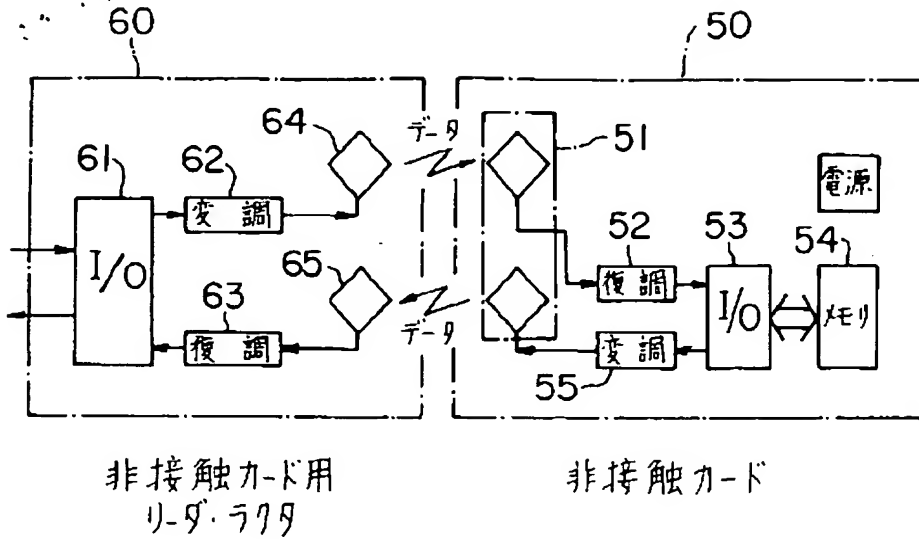
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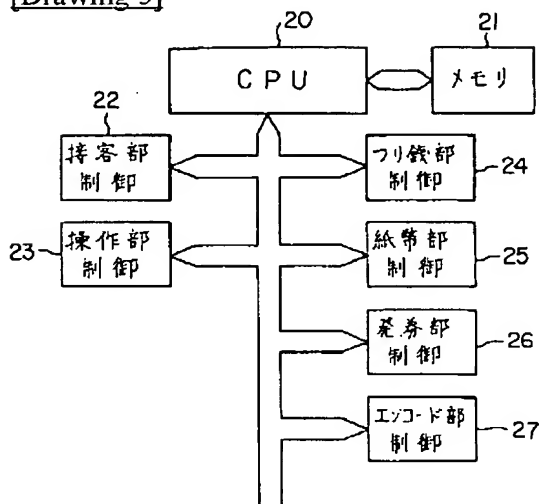
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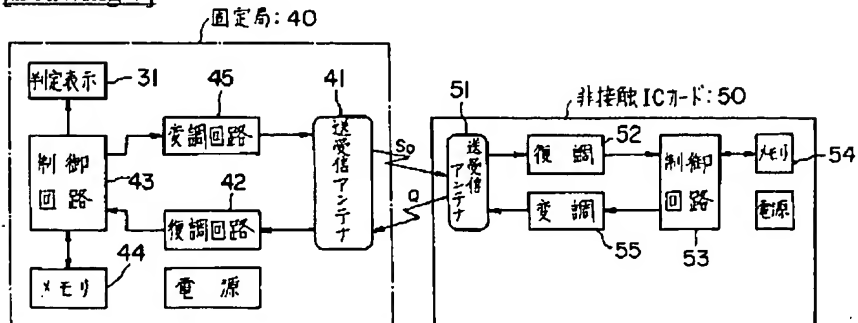
[Drawing 4]



[Drawing 5]



[Drawing 7]



[Translation done.]